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(71) Applicant (for all designated States except US): RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY [US/US]; Old Queens, Somerset Street, New Brunswick, NJ 08903 (US).			
(72) Inventors; and (75) Inventors/Applicants (for US only): KIRBY, Edward, G. [US/US]; 101 Childs Road, Basking Ridge, NJ 07920 (US); CANOVAS RAMOS, Francisco [ES/ES]; Urbanizacion Retamar, Calle Velero, 17, E-296130 Alhaurin de la Torre (ES); GALLARDO ALBA, Fernando [ES/ES]; Urbanizacion Sol de Benamaina 6, Calle Amatista, E-269631 Benamadena (ES).			
(74) Agents: KLANN, Ellen, M. et al.; Dann, Dorfman, Herrell and Skillman, Suite 720, 1601 Market Street, Philadelphia, PA 19103 (US).			

(54) Title: TRANSGENIC TREES HAVING IMPROVED NITROGEN METABOLISM

## (57) Abstract

Nitrogen is one of the principal factors limiting vegetative production. The present invention has improved the nitrogen metabolism in Poplar by integrating a transgene constitutively expressing a pine glutamine synthetase into the plant genome. The resulting transgenic trees exhibit higher growth rates, protein and chlorophyll contents, and leaf area than equivalent untransformed trees. It is contemplated that this approach to nitrogen improvement will be equally successful for all woody perennials. Provided with the invention is an expression cassette, a vector, and a method for increase glutamine synthetase activity in woody perennials, as well as transgenic woody perennials with enhanced nitrogen metabolism and accompanying phenotype.